

II. AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A system for producing electrochemical conversion in an electrochemical device comprising:

a first power converter connectable to the electrochemical device; and
a triggering circuit connectable to the first power converter, the triggering circuit comprising a pulse generator to trigger the first power converter to generate positive pulses of current for passing through the electrochemical device causing electrochemical conversion in the electrochemical device; wherein:

the first power converter, triggered by the pulse generator, is arranged to generate positive pulses of current having a duration of between 50 to 1000 microseconds;

the electrochemical device having a settling time of between 1 to 10 milliseconds to produce a duty cycle of between 1:10 to 1:200; and

the triggering circuit is further arranged to generate a negative discharge pulse to occur either before or after one or more of the positive pulses.

2. (Original) A system according to claim 1, wherein the electrochemical device is a battery.

3. (Original) A system according to claim 1, wherein the electrochemical device is a primary cell, for example a dry battery.

4. (Currently Amended) A system according to claim 1, wherein the electrochemical device is a secondary cell, ~~for example a lead acid battery.~~
5. (Original) A system according to claim 1, wherein the electrochemical device is an electroplating apparatus.
6. (Currently Amended) A system according to claim 1, ~~wherein the power converter is arranged to generate pulses of current having a duration of between around 50 to around 1000 microseconds.~~ 3, wherein the primary cell is a dry battery.
7. (Currently Amended) A system according to claim 1, wherein the positive pulses of current have a substantially constant pulse width, the pulse width being controlled by the first power converter.
8. (Currently Amended) A system according to claim 1, wherein the electrochemical device is a battery, and the pulses of current have an amplitude around one hundred times the amplitude of current required to charge or discharge completely the available capacity of the battery over a twenty hour period ~~(C₂₀ charge).~~
9. (Currently Amended) A system according to claim 1, ~~wherein the electrochemical device has a settling time of between around 1 to 10 milliseconds to produce a duty cycle of between around 1:10 to around 1:200.~~ 4, wherein, the secondary cell is a lead acid battery.

10. (Currently Amended) A system according to claim 1, wherein the first power converter comprises one or more pairs of ~~inductor/capacitor~~ inductor and capacitor combinations connectable as one or more series resonant circuits.

11. (Currently Amended) A system according to claim 10, wherein the first power converter has a low impedance.

12. (Currently Amended) A system according to claim 1, wherein the first power converter comprises at least two inductors and at least two capacitors to form two or more series resonant circuits in parallel, arranged such that the currents in the inductors are unidirectional and the currents in the capacitors are bidirectional.

13. (Original) A system according to claim 12, wherein the windings of the at least two inductors are wound on a single core.

14. (Currently Amended) A system according to claim 13, wherein the system further comprises a first further winding which is additional to said windings of the at least two inductors, said first further winding being ~~[[is]]~~ arranged on the core to form a step-down transformer.

15. (Currently Amended) A system according to claim 14, wherein the further winding is arranged to provide unidirectional charging current pulses to the electrochemical device via a rectifying diode.

16. (Currently Amended) A system according to claim 14, further comprising a second further winding which is additional to said windings of the at least two inductors, said second further winding being arranged on the core to form a demagnetisation winding.

17. (Currently Amended) A system according to claim ~~[[1]]~~12, wherein the triggering circuit comprises a pulse generator for producing firing current pulses for a number of thyristors to control the charging and discharging of the resonant circuit(s), the transistors being connectable to the first power converter and the pulse generator ~~to control the charging and discharging of the resonant circuit(s) by switching between components of the resonant circuit(s).~~

18. (Currently Amended) A system according to claim 17, wherein the first power converter is arranged such that the current therethrough reverses in ~~[[the]]~~ a second half of ~~[[the]]~~ an oscillation cycle to turn off the thyristor(s).

19. (Currently Amended) A system according to claim 1, wherein the system further comprises a second pulse generator connectable to a second power converter, the second power converter being connectable to the electrochemical device for producing ~~[[a]]~~ the negative discharge current pulse between the positive current pulses generated by the first power converter

for reducing the amount of gas produced in the electrochemical device due to the positive current pulses.

20. (Original) A system according to claim 19, wherein the negative current ~~pulse(s)~~pulses have an energy content indicative of the energy available within the negative discharge current pulse(s) and the positive current pulse(s) have an energy content indicative of the energy available within the positive current pulse(s), the energy content of the negative current pulse(s) being less than the energy content of the positive current pulse(s).

21. (Previously Presented) A system according to claim 1, wherein the power converter comprises a resonant circuit.

22. (Currently Amended) A method for producing electrochemical conversion in an electrochemical device comprising:

triggering a power converter to generate positive current pulses through the electrochemical device to produce the electrochemical conversion;

generating said positive pulses of current wherein said positive pulses of current have a duration of between 50 to 1000 microseconds;

the electrochemical device having a settling time of between 1 millisecond to 10 milliseconds to produce a duty cycle of between 1:10 to 1:200; and

generating a negative discharge pulse to occur either before or after one or more of the positive pulses.

23. (Canceled)

24. (Canceled).

25. (Canceled).